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TWO *STELIS* (*ODONTOSTELIS*) AND A *MELIPONA* BEE THAT HAVE BEEN RECORDED IN ERROR AS ANTHIDIINAE

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Some bees of the subfamily Stelidinae which occur as inquilines in the nests of Anthidiine bees have a rather close resemblance to their hosts. The presence on the under side of the abdomen of a dense brush for collecting pollen grains characterizes, however, the females of the Anthidiinae; in contrast, the females of the Stelidinae, which lay their eggs on the provisions gathered by their hosts, lack this equipment for an industrious life or have it poorly developed. There is, therefore, little difficulty as a rule in separating the females of the Anthidiinae from the females of the Stelidinae, although even in this sex the distinction is sometimes hard to establish. The males, on the other hand, are not so readily differentiated, with the result that some species that were originally described from the male have been assigned to the wrong group.

Although the Anthidiinae are easily separated structurally in both sexes from the Meliponidae, nevertheless some *Melipona* are superficially rather like the Anthidiinae, one *Melipona* having even been given the specific name *anthidioides*. What I believe to be a misinterpretation of Packard (referred to at the close of this paper) rests, it would seem, on the convincing character of these superficial resemblances.

Stelis (Odontostelis) bivittatum (Cresson)

Anthidium bivittatum CRESSON, 1878, Trans. Amer. Entom. Soc., VII, pp. 116–117. FRIESE, 1911, 'Das Tierreich,' Lieferung 28, pp. 391, 394.

Dianthidium bivittatum COCKERELL, 1912, Entomological News, XXIII, p. 445; 1913, Annals and Magazine of Natural History, (8) XII, p. 108; 1914, Proc. U. S. Nat. Mus., XLVII, p. 91.

Stelis abnormis FRIESE, 1925, Stettiner Entomologische Zeitung, LXXXVI, Heft 2, pp. 35–36.

Stelis (Odontostelis) abnormis COCKERELL, 1931, Annals and Magazine of Natural History, (10) VIII, pp. 541–542.

In my estimation *bivittatum*, described by Cresson (1878) as an *Anthidium*, is the same insect as that described by Friese (1925) under the name *Stelis abnormis*. I have had opportunity to examine Cresson's type of *bivittatum* and I have likewise had access to specimens—a male

and a female—identified by Friese as *abnormis*. The specimens from Friese were secured at San José, Costa Rica, which is the type locality of *abnormis*, and the collector, Schmidt, is the very individual from whom Friese received his type material, but the specimens do not bear a type label. The date associated with the female is unfortunately slightly effaced, but seems to read "5. 25." The notation "ex *Euglossa*" on the label of the male suggests that the specimen was one of those to which Friese alluded (1925) as having emerged from a nest of *Euglossa viridissima*. The date recorded on the label is July 10, 1923,—probably the date of emergence.

It seems to me not unlikely that what Cockerell described as the female of *Dianthidium bivittatum* in 1913 is also the same insect as that referred to in 1931 as *Stelis abnormis*. It is true that in Cockerell's description of the female of *bivittatum* the inner edge of the mandibles is said to be quadridentate whereas the female of *abnormis* is described by Friese as having a quinquedentate inner edge. The female in the American Museum collection that was identified by Friese as *abnormis* actually has, however, a four-toothed mandible but the innermost tooth is faintly bidentate and, if this condition were more pronounced (and this may have been the case in Friese's type), the term quinquedentate would apply. In another female specimen, collected at Pto. Castilla, Honduras, March 30, 1924, and loaned me by the British Museum, the mandibles are indubitably quadridentate. I think the seeming discrepancy in the descriptions is probably ascribable to slight variability in this structural character.

Cresson in describing the male of *bivittatum* indicated that the yellow band encircling the head posteriorly is sometimes interrupted, and this variability occurs also in the female of *bivittatum*. Maculations like the upwardly divergent stripes between the antennae (corresponding more or less to the carinae in this area) and the stripes on the under side of the middle femora,[1] mentioned in Cockerell's description (1913) of the female of *bivittatum* but omitted from Friese's description (1925) of *abnormis*, nevertheless are present in the female identified by Friese as *abnormis*.

Of significance is the fact that the female of *bivittatum* has, according to Cockerell (1913), "ventral scopa thin and short," which is the condition in Friese's specimen of *abnormis*.

In general, except for the usual sexual differences, the male and female of *bivittatum* are structurally rather similar. Both sexes have

[1]Cresson's statement in the description of the male that the tibiae are striped beneath would seem to be a slip of the pen when he intended to say femora.

carinae between the antennae that diverge above; both have large, coarse punctation on the scutellum, contrasted with the much finer punctation of the tergites of the abdomen; and in both the basal margin of the metathorax is strongly pitted and the enclosure polished or barely tessellate, with a few punctures on each side near the top.

What strikingly differentiates the female from the male, however, is the presence of a large, rather triangular, black-edged, tooth-like elevation at the base of the mandible. In the male the base of the mandible is devoid of such a character. This sexual dimorphism parallels that described by Friese in the case of the South American species, *portoi*, which both structurally and in its maculations is very close to *bivittatum*.

Cresson's *bivittatum* was described from Mexico, and its range extends at least to the Canal Zone, from which there is in the American Museum a male specimen collected by T. Hallinan at Balboa, June 11–14, and a female specimen from Barro Colorado collected by F. E. Lutz, March 21, 1933.

An insect to which the male, at least, of *bivittatum* is structurally rather similar is *Dianthidium* (*Anthodioctes*) *calcaratum* (Friese), originally described as a *Stelis*. Although a smaller insect, *calcaratum* has, however, much stronger and larger punctation on the head, and particularly on the mesonotum and pleura, than has *bivittatum*, its forewings are darkened along the anterior margin (not orange colored to ferruginous except for the apical tip as in *bivittatum*), the hairs on the sternites of the male are white, short, and undifferentiated (in the male of *bivittatum* the hairs on the sternites are a little longer and on the apex of sternite 3 there is a fringe of very long yellowish hairs that are incurved).

There is before me a series of *calcaratum* from S. José, including a male and a female collected by H. Schmidt on "5.25."

It would seem probable that *bivittatum*, which is in many of its characters much like *calcaratum* and may even be derived from it, is an inquiline in nests of *calcaratum* as well as in those of the *Euglossa* mentioned by Friese. It is to be noted, in this connection, that as to place, collector, and date, some of the specimens of *calcaratum* and of *bivittatum* are in accord.

Stelis (Odontostelis) portoi (Friese)

Anthidium portoi FRIESE, 1910, Deutsche Entomologische Zeitschrift, p. 694. DUCKE, 1908, Revue d'Entomologie, Caen, XXVII, p. 77.

Dianthidium (*Anthodioctes*) *portoi* COCKERELL, 1927, Proceedings of U. S. Nat. Museum, LXXI, Art. 12, p. 2 (tentatively included in a "Key to Species belonging to, or resembling, Anthodioctes").

A female specimen of what I believe to be *portoi* has been loaned by the British Museum. It was collected by W. M. Wheeler at Kartabo, 1920, and extends the known range of *portoi* from Brazil into British Guiana. In this specimen of *portoi* the stout tooth-like elevation at the base of the mandibles of the female is more pronounced even than in *bivittatum* and the apical two-thirds of the mandible is more slender and sickle-like than in *bivittatum*. As in *bivittatum*, there are four teeth along the receding apex of the mandible, the fourth tooth, widely separated from the other three, constituting the inner angle of the mandible. In another structural character the females of *bivittatum* and *portoi* are rather different. Friese describes the clypeus of the female of *portoi* as "broad, blunt, prolonged at the middle into a small spine," and this is the condition also in the specimen from Kartabo. In sharp contrast the similarly broad clypeus of the female of *bivittatum* has toward the middle of the apex two slightly diverging, stubby spines separated from each other at the base by about the length of one of them. The clypeus of the female of *portoi* is partly yellow, that of the female of *bivittatum* black, but in other respects their maculations agree rather closely, even to the presence of pale stripes on the under side of the femora in *bivittatum* and in the Kartabo specimen of *portoi* (not mentioned in Friese's description of *portoi* and possibly not shared therefore by Brazilian representatives of *portoi*). The conspicuous stripes on the dorsum of the thorax are shared by both sexes of *bivittatum* and *portoi*.

If *bivittatum* is to be considered a *Stelis* (and the observations of Friese on its inquiline habits would seem to sustain its allocation to that genus), then *portoi*, so similar in many respects to *bivittatum*, is also to be considered a *Stelis*. Indeed Friese (1910) noted in connection with the description of the male of *portoi:* "Sternites 3–5 depressed, as in *Stelis*." Although Friese does not allude to the scanty development of the ventral scopa of the female, the specimen of *portoi* from Kartabo presents a condition to which the description of the female of *bivittatum* could well be applied: "ventral scopa thin and short."

The females of both *bivittatum* and *portoi* have antennae very like those of the male of at least *bivittatum*, the third joint being very small, comparable in length to the narrower second joint.

Melipona interrupta subspecies **grandis** Guérin

Melipona grandis Guérin, 1844 (?), 'Iconogr. du Règne animal de G. Cuvier,' III, p. 463. Smith, 1854, 'Catal. Hymenoptera British Mus.,' part 2, p. 405. Dalla Torre, 1896, 'Catalogus Hymenopterorum,' X, p. 579.

Anthidium pictifrons PACKARD, 1869, 1st Rep. Peabody Acad. Sci., p. 59. FRIESE, 1911, 'Das Tierreich,' Lieferung 28, pp. 392, 399.

Melipona interrupta aequatorialis SCHULZ, 1903, Sitzungsbericht Math. Phys. Klasse der K. B. Akad. der Wissens., München, (pub. 1904), XXXIII, pp. 815–816.

Melipona interrupta subspecies *grandis* DUCKE, 1910, Deutsch. Ent. Zeitschr., p. 367; 1916, 'Enumeração dos Hymenopteros collegidos pela Commissão e Revisão das Especies de Abelhas do Brasil,' p. 163; 1925, Zool. Jahrb. System. Geogr. u. Biol., XLIX, pp. 440–441. SCHWARZ, 1932, Bull. Amer. Mus. Nat. Hist., LXIII, Art. 4, pp. 286, 290, 293, 298, 304, 305–307.

I strongly suspect that what Packard described as *Anthidium pictifrons* is no other than *Melipona interrupta* subspecies *grandis*. Such elements in the description as "but one subcostal cell, and that faintly marked on the outer side" and "hind tibiae broad, convex, polished black, with a slight fringe of white hairs" and "a long curved brush of bristles at the tibiotarsal joint" are all suggestive of *Melipona* but seem definitely to alienate the specimen from *Anthidium*. The details of the description of *pictifrons* fit *Melipona interrupta* subspecies *grandis* almost perfectly.

Friese, 1911, had expressed strong doubt whether Packard's insect could be assigned to *Anthidium*.